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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,783	UCHIDA ET AL.	
	Examiner	Art Unit	
	Darcy D. LaClair	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/22/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **4/13/2009**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The new grounds of rejection set forth below are necessitated by applicant's amendment filed on **4/13/2009**. In particular, **Claims 1 and 15** have been amended to recite an aqueous polyurethane resin, the chain extension agent is selected from diamine, hydrazine, and a hydrazine derivative, and the polyamine compound is at least one member of a newly recited Markush group. The aqueous polyurethane is supported on page 8, line 11-12, the chain extension agent is supported in the original language of Claims 2, 3, 16 and 17 as well as on page 11 line 7-8, and the polyamine compound is supported on pages 21-22, par [0055]. The aqueous polyurethane and polyamine limitations, as well as this particular combination of limitations were not present in the claims at the time of the preceding Office Action. Thus, the following action is properly made **FINAL**.

Double Patenting

Double Patenting, I

2. **Claims 1-21** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over **Claims 1-11** of **U.S. Patent No. 6,979,493** in view of **Harada et al**. (**US 5,981,029**)

It is noted that **Claims 1, 3, 15 and 17**, with respect to the polyurethane resin, are stated in product by process format.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Absent showing of criticality, the process limitations in a product-by-process claim do not carry patentable weight.

With regard to Claim 1, 6 and 15, the conflicting patent claims an aqueous dispersion comprising a gas barrier polyurethane resin having urea and urethane groups in a concentration of 30 to 42.9% by weight, where the urethane comprises a diisocyanate selected from aromatic, araliphatic, and alicyclic diisocyanates, a C_2-C_8 diol or alkylene diol, and a diamine having 8 or less carbon atoms (Claim 1-3) and 0.1 to 50 parts by weight of a layered inorganic compound (Claim 6,7) which is water swellable (Claim 8). With regard to the chain extension agent, or diamine component, applicant has taught diamines such as hydrazine, aliphatic diamines, aromatic amines, and alicyclic amines, as well as diamines having a hydroxyl group such as 2-hydrazinoethanol. (See col 4 line 54-67) While the conflicting patent does not claim a polyhydroxyalkanecarboxylic acid explicitly, this is encompassed by the claimed diol. The specification teaches that in order to prepare an aqueous dispersion, a hydrophilic group may be introduced to the prepolymer used to generate the urethane through a reaction of an isocyanate with a hydrophilic compound as at least a part of the diol or diamine component, dispersing the resultant polyurethane in solvent, and extending the

chain using a diamine as a chain extending agent. (col 5 line 64- col 6 line18) As the hydrophilic compound, dihydroxycarboxylic acids, dihydroxy C4-C10 polycarboxylic acids, and dihydroxy aromatic carboxylic acids may be used. (col 6 line 15-30) These carboxylic acids meet the limitation (B) requiring polyhydroxyalkanecarboxylic acids. Furthermore, Uchida exemplifies dimethylol propionic acid (see Production Example 8, 9) which is consistent with this requirement. Production Examples 8 and 9 indicate that the isocyanate and polyhydroxyalkane carboxylic acid are mixed together, neutralized, and then chain extended. (See Col 13-14) Note MPEP 804: "Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in the application defines an obvious variation of an invention claimed in the patent. In re Vogel, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970)."

Further, the conflicting patent teaches that the polyurethane resin can be obtained by a urethanizing reaction of a diisocyanate, a diol component, and a diamine component. (col 3 line 23-28) The conflicting patent also teaches a neutralizer (see col 6 line 58-67) It would be obvious to one of ordinary skill in the art to chain extend the polyurethane prepolymer before neutralizing. Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also In re *Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of

any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re *Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.).

With regard to the portion of the acid group of the polyurethane resin relative to the basic nitrogen atom of the polyamine compound, Uchida fails to specifically teach an acid or amine value for the constituents presented, however Uchida exemplifies 3-[N-(2-aminoethyl)amino] propylmethyldimethoxysilane (see Production Example 10), which is consistent with the gamma-(2-aminoethyl)amino propylmethyldimethoxysilane exemplified by applicant, having an amine value of 544 mg KOH/g (see applicant's specification p. 31 line 25-26). See the structures, below, in paragraph 5. Production Example 9, a 25% by weight polyurethane resin, which is used with this compound in Production Example 10, uses hydrogenated XDI, dimethylol propionic acid) and ethylene glycol in similar concentrations and ratios as Production Example 1 and 3, (see applicant's specification p. 28 and 29-30) as well as a solvent and triethylamine as a neutralizer. Furthermore, Production example 10 uses these in a mixture of 500 g to 6 g (or 100:1.2 parts) (see col 15 line 5 - 14), and applicant uses these in a ratio of 100 parts of 25% by weight polyurethane solution to 1.24 parts of AEAPS. (See Applicant's Table 1) This is substantially the same chemical compounds being combined in substantially the same ratio, and would therefore fall within applicant's claimed range for the acid and amine value for the respective compounds, as well as for the ratio of the acid group of the polyurethane resin to the basic nitrogen atom of the polyamine compound. See MPEP 2112.01 "Products of identical chemical composition can not

have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)

Uchida teaches that a polyamine can be used together with the diamine chain extending compound (see col 5 line 9-11) but does not explicitly teach a type of polyamine compound. Harada teaches a gas barrier film containing an amine compound (see abstract) for use in a variety of polymers including urethane based polymers (see col 3 line 30-31) which can be compounds including alkylamines and alkyleneamines such as ethylenediamine and propylenediamine. (See col 4 line 6-36) This amine yields an improvement in adhesiveness and post-lamination gas barrierability. (See col 4 line 7-10) It would be obvious to one of ordinary skill in the art to employ such a polyamine compound in the invention of Uchida, which teaches a polyamine used in concert with a diamine, in order to obtain the benefit of improved lamination gas barriability and improved adhesiveness.

With regard to Claims 2-3 and 16-17, the conflicting patent claims a diisocyanate selected from aromatic diisocyanate, an araliphatic diisocyanate, and an alicyclic diisocyanate, a C_{2-8} diol, and a diamine having 8 or less carbon atoms (Claim 1) With regard to the isocyanate, the claim would necessitate 100% of the types of isocyanate, and the diol required by applicant.

With regard to Claims 4 and 18, the conflicting patent claims xylene diisocyanate and hydrogenated XDI (Claim 4)

With regard to Claims 5 and 19, the conflicting patent claims a layered inorganic compounds (Claim 6,7) which is water-swellable (Claim 8).

With regard to Claims 7 and 20, the conflicting patent claims 0.1 to 50 parts of inorganic compound to 100 parts of the polyurethane resin (or 1/100 to 50/100). (Claim 7) This covers a large portion of the very broad range indicated by applicant.

With regard to Claims 8-14 and 21, the conflicting patent claims a gas barrier composite film composed of a base film layer and a resin layer at least comprising the polyurethane resin, and that the polyurethane resin may be used as a single-layered filmy article or a multi-layered article constructed of a base and layer(s) formed thereon. (Claims 9-11)

3. **Claims 1-21** directed to an invention not patentably distinct from **Claims 1-11** of commonly assigned **U.S. Patent No. 6,979,493** in view of **Harada et al. (US 5,981,029)**. Specifically, see the discussion set forth above, in **paragraph 2**.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned **U.S. Patent No. 6,979,493**, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions

were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

Double Patenting, II

4. **Claims 1-21** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over **Claims 1-11** of **U.S. Patent No. 6,569,533** in view of **Harada et al**. (**US 5,981,029**)

It is noted that **Claims 1, 3, 15 and 17**, with respect to the polyurethane resin, are stated in product by process format.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Absent showing of criticality, the process limitations in a product-by-process claim do not carry patentable weight.

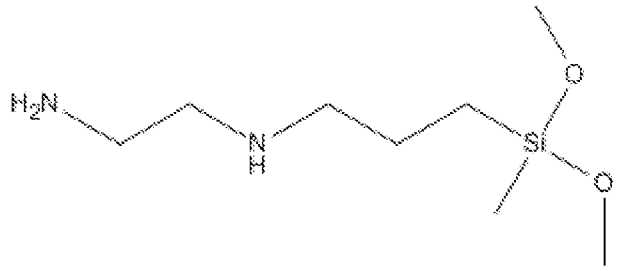
With regard to Claim 1 and 15, Uchida teaches an aqueous (col 5 line 35) polyurethane resin having a total concentration of the urethane group and the urea group of not less than 15% by weight, (see col 2 line 50-51) preferably about 20% by weight, and more preferably about 35% to 60% by weight. (see col 7 line 19-27), a

layered inorganic compound, (see col 3 line 1-2) and a diamine component. (see col 3 line 21) This completely covers applicant's stated range with regard to the content of urethane and urea groups, and indicates that the preferable range directly overlaps applicant's range. Uchida teaches that a polyamine can be used together with the diamine component. (See col 5 line 4-6) Uchida teaches that a diamine component may be used as a chain extending agent, and examples of the diamine are hydrazine, aliphatic diamines, aromatic amines, and alicyclic amines, as well as diamines having a hydroxyl group such as 2-hydrazinoethanol. (See col 4 line 48-62)

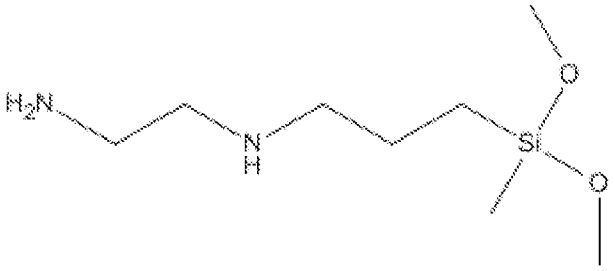
With regard to the polyurethane resin obtained by a reacting (A) a polyisocyanate compound (B) a polyhydroxyalkane carboxylic acid, (D) a chain extension agent, and neutralizing the resultant product with a neutralizing agent, Uchida teaches that the polyurethane resin can be obtained by a urethanizing reaction of a diisocyanate, a diol component, and a diamine component. (col 3 line 18-21) Uchida further teaches that in order to prepare an aqueous dispersion, a hydrophilic group may be introduced to the prepolymer used to generate the urethane through a reaction of an isocyanate with a hydrophilic compound as at least a part of the diol or diamine component, dispersing the resultant polyurethane in water, and extending the chain using a diamine as a chain extending agent. (col 5 line 60-67) As the hydrophilic compound, dihydroxycarboxylic acids, dihydroxy C4-C10 polycarboxylic acids, and dihydroxy aromatic carboxylic acids may be used. (col 6 line 15-30) These carboxylic acids meet the limitation (B) requiring polyhydroxyalkanecarboxylic acids. Furthermore, Uchida exemplifies dimethylol propionic acid (see Production Example 8, 9) which is consistent with this requirement.

Production Examples 8 and 9 indicate that the isocyanate and polyhydroxyalkane carboxylic acid are mixed together, neutralized, and then chain extended. (See Col 13-14) It would be obvious to one of ordinary skill in the art to chain extend the polyurethane prepolymer before neutralizing. Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also In re *Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re *Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.).

With regard to the portion of the acid group of the polyurethane resin relative to the basic nitrogen atom of the polyamine compound, Uchida fails to specifically teach an acid or amine value for the constituents presented, however Uchida exemplifies 3-[N-(2-aminoethyl)amino] propylmethyldimethoxysilane (see Production Example 10), which is consistent with the gamma-(2-aminoethyl)amino propylmethyldimethoxysilane exemplified by applicant, having an amine value of 544 mg KOH/g (see applicant's specification p. 31 line 25-26). See the structures, below, prepared using ChemDraw Ultra:



g-(2-aminoethyl)amino propylmethyldimethoxysilane



3-[N-(2-aminoethyl)amino] propylmethyldimethoxysilane

Production Example 9, a 25% by weight polyurethane resin, which is used with this compound in Production Example 10, uses hydrogenated XDI, dimethylol propionic acid) and ethylene glycol in similar concentrations and ratios as Production Example 1 and 3, (see applicant's specification p. 28 and 29-30) as well as a solvent and triethylamine as a neutralizer. Furthermore, Production example 10 uses these in a mixture of 500 g to 6 g (or 100:1.2 parts) (see col 14 line 52 - 54), and applicant uses these in a ratio of 100 parts of 25% by weight polyurethane solution to 1.24 parts of AEAPS. (See Applicant's Table 1) This is substantially the same chemical compounds being combined in substantially the same ratio, and would therefore fall within applicant's claimed range for the acid and amine value for the respective compounds, as well as for the ratio of the acid group of the polyurethane resin to the basic nitrogen atom of the polyamine compound. See MPEP 2112.01 "Products of identical chemical

composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)

Uchida teaches that a polyamine can be used together with the diamine chain extending compound (see col 5 line 9-11) but does not explicitly teach a type of polyamine compound. Harada teaches a gas barrier film containing an amine compound (see abstract) for use in a variety of polymers including urethane based polymers (see col 3 line 30-31) which can be compounds including alkylamines and alkyleneamines such as ethylenediamine and propylenediamine. (See col 4 line 6-36) This amine yields an improvement in adhesiveness and post-lamination gas barrierability. (See col 4 line 7-10) It would be obvious to one of ordinary skill in the art to employ such a polyamine compound in the invention of Uchida, which teaches a polyamine used in concert with a diamine, in order to obtain the benefit of improved lamination gas barriability and improved adhesiveness.

With regard to Claims 2 and 16, Uchida teaches aromatic diisocyanates, araliphatic diisocyanates, alicyclic diisocyanates, and aliphatic diisocyanates for the diisocyanate component. (See col 3, line 23-25 and col 3-4 inclusive)

With regard to Claims 3 and 17, Uchida indicates that in view of gas barrier properties, aromatic diisocyanates, araliphatic diisocyanates, and alycyclic diisocyanates are preferable, with aromatic diisocyanates, araliphatic diisocyanates, and alicyclic diisocyanates particularly preferred. (See col 3 line 57-63) This would

lead one of ordinary skill in the art to selectively use these compounds. Furthermore, Uchida exemplifies the polyisocyanate compound as 100% 1,3-xylylene diisocyanate, (PE 1, 7), 4,4'-diphenylmethane diisocanate (PE 2), 2,4-tolylene diisocyanate, (PE 3, 4), a mix of 2,4-tolylene diisocyanate and 2,6-tolylene diisocyanate (PE 5), isophorone diisocyanate (PE 6), and 1,4-bis(isocyanatemethyl) cyclohexane (PE 8,9,11). This meets the limitation with regard to the content of a cyclic isocyanate. Uchida teaches that in view of gas barrier properties, a low molecular diol such as a C_{2-8} diol is used, and a C_{2-6} diol is preferably employed. This would lead one of ordinary skill in the art to select these compounds preferentially. Furthermore, Uchida exemplifies 1,4-butanediol (PE 1), ethylene glycol (PE 2,6,8,9), diethylene glycol (PE 3,11), 1,6-hexanediol (PE 4), 3-methyl-1,5-pentanediol (PE 5) triethylene glycol (PE 7), and dimethylol propionic acid (PE 8,9) used in 100% content in the urethane, meeting the requirement with respect to the diol compound.

With regard to Claims 4 and 18, Uchida teaches xylene diisocyanate and hydrogenated XDI (see col 3 line 54-55) and exemplifies 1,3-xylylene diisocyanate. (See PE 1, 7).

With regard to Claims 5 and 19, Uchida teaches layered inorganic compounds such as swellable micas, and preferably montmorillonite and smectite-series clay minerals. (See col 9, line 55-65) Montmorillonite and smectite clays are swellable clays.

With regard to Claim 6, see the discussion of Claims 1 and 15, above, with regard to the portion of the acid group of the polyurethane resin relative to the basic nitrogen atom of the polyamine compound.

With regard to Claims 7 and 20, Uchida teaches 0.1 to 50 parts of inorganic compound to 100 parts of the polyurethane resin (or 1/100 to 50/100). (See col 10 line 1-4) This covers a large portion of the very broad range indicated by applicant.

With regard to Claims 8-14 and 21, Uchida teaches a gas barrier composite film composed of a base film layer and a resin layer at least comprising the polyurethane resin. (See abs) Uchida further teaches that the polyurethane resin may be used as a single-layered filmy article or a multi-layered article constructed of a base and layer(s) formed thereon. (See col 10 line 20-26)

5. **Claims 1-21** directed to an invention not patentably distinct from **Claims 1-11** of commonly assigned **U.S. Patent No. 6,569,533** in view of **Harada et al. (US 5,981,029)**. Specifically, see the discussion set forth above, in **paragraph 3**.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned **U.S. Patent No. 6,569,533**, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

Claim Rejections - 35 USC § 103

6. **Claims 1-21** are rejected under 35 U.S.C. 103(a) as being obvious over **Uchida et al.** (**US 6,569,493**) in view of **Harada et al.** (**US 5,981,029**)

See the discussion above, in **paragraph 2**.

7. **Claims 1-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Uchida et al.** (**US 6,569,533**) in view of **Harada et al.** (**US 5,981,029**)

See the discussion above, in **paragraph 4**.

Response to Arguments

8. Applicant's arguments filed **4/13/2009** have been fully considered. Specifically, applicant argues

(A) The rejection of Claims 1-21 over Uchida '533 is traversed on the grounds that Uchida does not teach or suggest the specific combination of an aqueous polyurethane, a swelling inorganic layered compound, and a specific polyamine compound; the polyamine is not directed to an amino-group containing silane coupling agent, and the polyamine of Uchida is incorporated as a chain-extending agent into the

polyurethane resin or used in combination with other monomers to form the polyurethane resin, in other words, they do not contain a free chain extending agent and a polyurethane resin. Further, the reference discloses the addition of a layered inorganic compound and/or an amino group containing alkoxysilane to an aqueous polyurethane resin having an acid group and high concentrations of a urethane and urea group, but does not exemplify the use of the layered inorganic compound, and does not teach or suggest the combination of both a layered inorganic compound and a polyamide compound. Furthermore, the reference discloses that layered inorganic compounds are effective for improving the gas barrier properties of the polyurethane resin, and that the silane coupling agent is effective for improving the adhesion of the gas barrier polyurethane resin to base material, but does not teach or suggest a relationship between the silane coupling agent and gas barrier properties, and the polyamine compounds used in the present invention are different from silane coupling agents , which do not provide adhesion properties. Further, the amino group-containing alkoxysilane of Uchida is described as a component for improving adhesion to a base material, thus one of ordinary skill in the art would not have concluded that a polyamine compound without an alkoxysilyl group has the same function as an alkoxysilane with an amino group, thus there would be no suggestion to one of ordinary skill in the art to have used a polyamine compound not having an alkoxysilyl group. Furthermore, improvement in gas barrier properties with a polyamine compound would not have been expected,

(B) The claimed composition provides unexpected results in terms of oxygen permeability over the reference. In the present invention, because of the combination of specific polyurethane resin, swelling inorganic layered compound, and polyamine compound, the gas barrier properties are remarkably improved even under highly humid conditions; Specifically, by comparison of the Examples and Comparative examples in the present specification, the oxygen permeability under a condition of 80% relative humitity is improved to 8.3 to 15.2, compared to 24.0 and 27.4 in the comparative examples. (See Tables 1 and 2 in the specification) Furthermore, Comparative Example 3, which corresponds to production Example 10 of Uchida and does not comprise a swelling inorganic layered compound, shows low oxygen permeability, such as 45 and 139. Thus the claimed invention shows unexpected results over Uchida.

(C) The arguments presented regarding Uchida are equally applicable to both double patenting rejections (both Uchida '493 and Uchida '533) as Uchida '493 is a division of Uchida '533. Moreover, Claims 1 and 15 are amended to include the features that the polyurethane is an aqueous polyurethane resin, the chain extension agent is diamine, hydrazine, or a hydrazine derivative, and the polyamine compound is at least one selected from a newly recited Markush group. Claims 1-11 of Uchida '533 and Claims 1-11 of Uchida '493 do not recite or suggest these claimed features; Moreover Claim 6 of Uchida '533 is directed to a silane coupling agent, and therefore as discussed, one of ordinary skill in the art would not have concluded that a polyamine compound without a silyl group has the same function as an amino silane compound. Uchida '493 requires an aqueous dispersion comprising a gas barrier polyurethane resin

comprising a plurality of urea groups and a plurality of urethane groups, having a total concentration of urea and urethane groups of 30 to 42.9% by weight and a diisocyanate, a silane coupling agent, and a layered inorganic compound.

9. **With respect to argument (A) and (B),** applicant's arguments have been considered and the obviousness rejection over Uchida '533 been withdrawn ***in light of applicant's amendment*** which requires specific species for the polyamine. While Uchida '533 teaches the presence of a polyamine compound, specific species are not taught or exemplified. Support for the amendment is acknowledged. (See paragraph 1) However attention is directed to the rejection over Uchida '533 in view of Harada et al.

With respect to argument (C), applicant's arguments have been considered and the obviousness type double patenting rejections over Uchida '533 and Uchida '493 been withdrawn ***in light of applicant's amendment*** which requires specific species for the polyamine. While Uchida '533 and Uchida '493 teach the presence of a polyamine compound, specific species are not taught or exemplified. However attention is directed to the obviousness type double patenting rejections over Uchida '533 and Uchida '493 in view of Harada et al.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner
Art Unit 1796

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